JAVA + DSA

Introduction of Java - Architecture

=> How Java Code executes

| • Java file (human readable)	Compiler (Centre file)	• Class file (byte Code)	interpreter (line byline)	Machine Code (0 and 1)
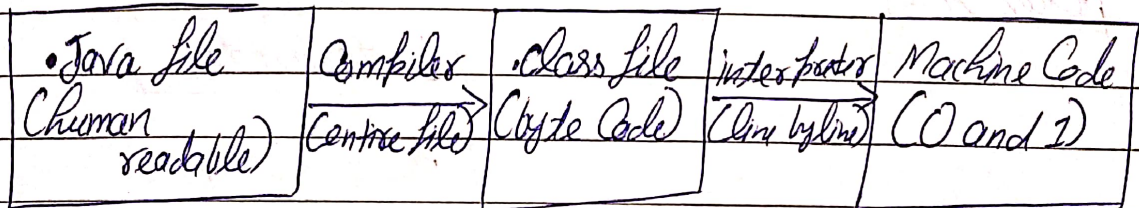
This is the source Code.   - this Code will not directly run on a system.

- We need JVM to run this
- Reason why Java is Platform independent

=> We can provide this byte Code to any system means we can Compile the java code on any system.

=> But JVM is platform dependent means for every O.S. the executable ~~dependent means~~ file that we get it has step by step set of instruction dependent on platform
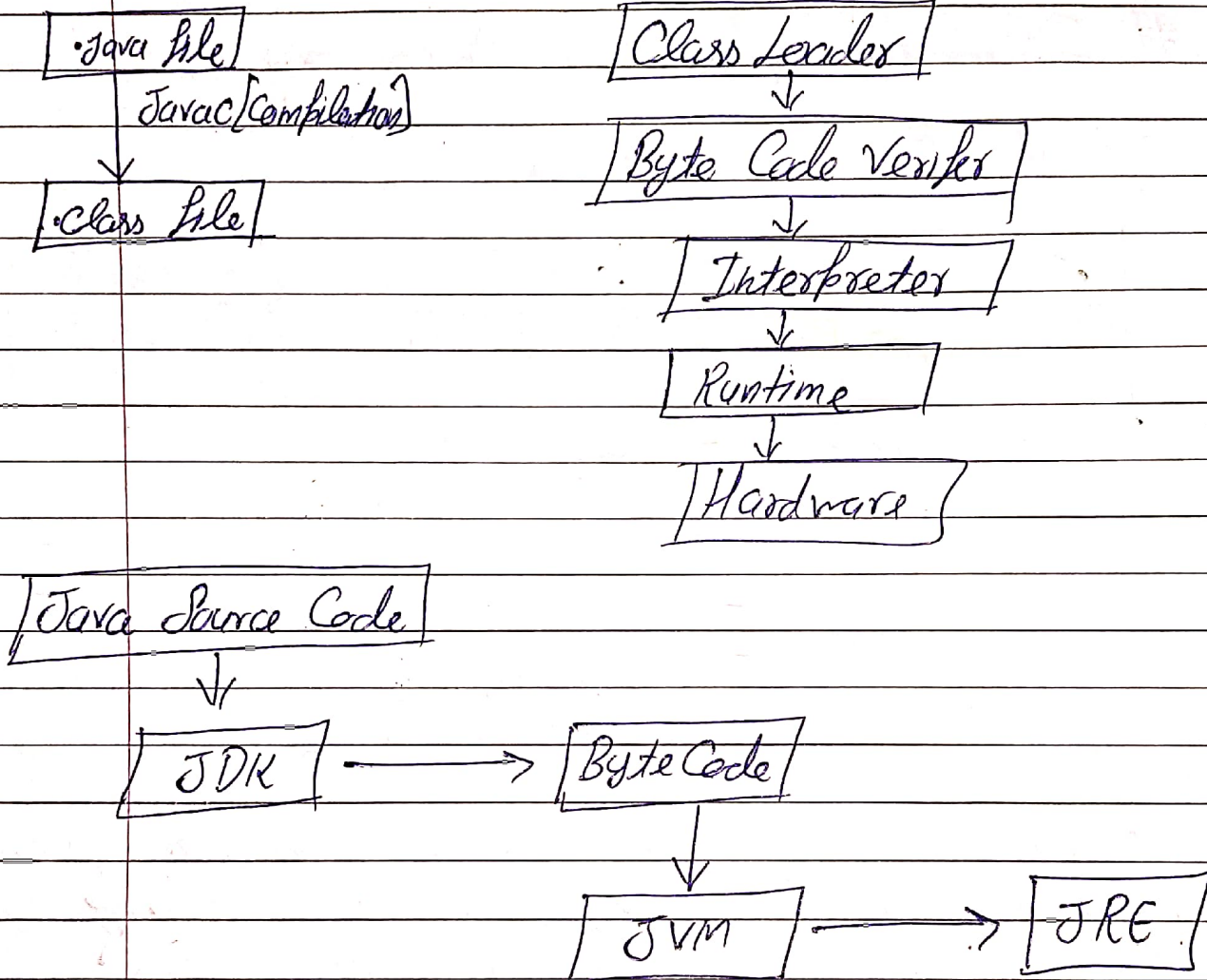
JDK => Provides environment to develop & run the Java program
JIT : [Just-In-Time] makes execution faster Garbage Collector

JDK = JRE + Development tools

JRE = JVM + Library Classes

JVM

JIT
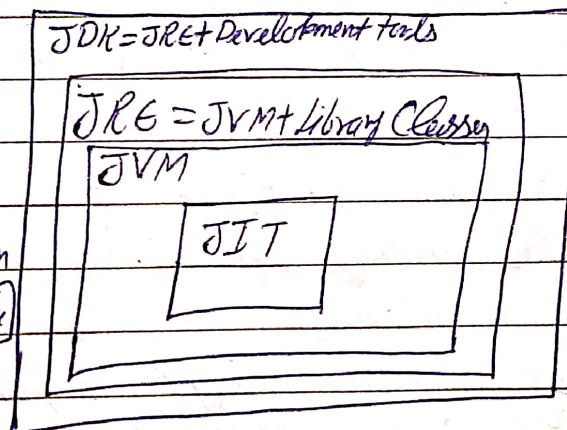
JRE => It is installation package that provides to only run the program
JVM => • line by line execution • when one method is called, many time it will interpret again again

Compile time	Runtime

Compile time

- · Java file
- Javac (Compilation)
  ↓
- · class file

Runtime

- Class Loader
  ↓
- Byte Code Verifier
  ↓
- Interpreter
  ↓
- Runtime
  ↓
- Hardware

Java Source Code
  ↓
JDK ———→ Byte Code
              ↓
            JVM ———→ JRE

(How JVM works) Class Loader
   - Loading :
      - reads ·class file and generate binay data
      - an object of this class is created in heap.
   - Linking :
      - JVM verifies the ·class file
      - allocates memoy for class variable &
        defaul values.
      - replace symbolic refrence for the type
        with direct rifrence

- Initialization

all static variable are assigned with their value defined in the Code & static block.

JVM Contains the stack and Heap memory allocation